

5 a microphone 103 that attaches to a phone line 109 and the set 101 which may be a headset or a handset communicating by RF. The system has an intercom mode that allows communication between the base 104 and the set 101. Also the device can conference between the base 104, the PSTN 180 and the set 101.

10 In the normal intercom mode, sound detected by the microphone 103 of the base 104 is transmitted to the speaker 191 of the set 091, and sound detected by the microphone 192 of the set 101 is transmitted to the speaker 102 of the base 104. A speaker driver 193 drives the speaker 102 in the base 104, and the microphone 103 is connected to a pre-amplifier. Audio signals in the phone 100 are re-routed so that the phone 100 audio input is enabled through the base line in 106 and audio output is enabled through base line out 107 connections.

15 When the phone 100 is in communication with the computer 110 through the computer sound card 116, the base line in 108 connection receives a signal from the audio output 114 of the computer sound card, and in turn the signal is directed through the microphone pre-amplifier and transmitted to the set 101 earpiece.

20 The base line out 107 receives its signal from the base speaker driver 193, and in turn the signal is sent to the microphone input 115 of the sound card 116. The signal is attenuated to a level appropriate for the proper input of the connecting device. When the base unit 104 is operating in Mode A, and the user 190 speaks into the set 101 microphone 192, the resultant audio signal is transmitted to the base in 106. From here the signal is routed 196 to the line out 107 and into the computer microphone 115.

25 Conversely, any audio signal produced by computer speaker out 114 is transmitted to line in 108 and then through 197 to the base out 105 and to the handset speaker 191. Audio, transmitted or received by the sound card 116, could be used, but not limited to, Internet telephony 111, audio recording/playback 112, or speech recognition/voice command 113.

Audio signals, sent and received from the base line in 108, and out 107, could be transmitted by the computer, using Internet telephony software 111, through the Internet 140 to an Internet telephony provider 150. The provider 150 could call a remote telephone user 170 through the PSTN 160. The result would be full duplex communication between the user 190 and the remote telephone user 170.

III. Details of the Components and Operation:

In mode A, running audio recording software 112, would allow the user's voice to be recorded via the set 101. In addition, audio could be played back to the user 190 from the computer 110 through the set 101. Operating in mode A and running speech recognition/voice command 113 on the computer 110, would allow the user 190 to control the computer 110, or any other device attached to the computer 110, for example home automation devices 120, by audio.

FIG. 2 shows a diagram of a preferred embodiment of the present invention in mode B. This mode allows the invention to operate as a standard cordless phone. The audio generated by the user 190 through the microphone 192 is transmitted via RF to the base unit's 104 reception circuitry, base in 106 and then through the phone line interface 109. Inbound audio from the phone line in 108 is transmitted to the base out 105 and thence via RF to the set speaker 191. Additionally DTMF tones can be generated to allow dialing of phone numbers.

FIG. 3 shows a diagram of a preferred embodiment labeled mode C. In this mode the invention allows for communication with devices linked through the base unit's line in 108, line out 107, RF in 106, RF out 105, and the phone line. When the user 190 generates audio through the microphone 192, it is transmitted 391, 393, through the base in 106 to the phone line interface 109 and the line out 107.

When the audio is generated from the phone line interface 109, it is conducted 395, 396 to the base out 105 and the base line out 107. When audio

is generated from the computers speaker 114, it is conducted to the base line in 108, and then via 392 to the phone line interface 109, and by 393 to the base RF out 105. From there it is transmitted to the set 101 for playback on the speaker 191. This allows full duplex conferencing between the computer 110 and the user 190, an Internet telephony caller 170 and a regular PSTN caller 181. Recordings or plays back (through 112) of telephone calls between users could be made.

FIG. 4 shows a diagram of a secondary embodiment of the invention. The phone 100 has the capacity to operate with standard audio recording and playback devices 410, as well as to act as a telephone. This means that conversations could be recorded and played back, playback recorded audio into a telephone conversation, or play a telephone conversation live over an audio sound system. The set 101 could be used to record the user's 190 voice for purposes such as dictation.

II. Working Example:

FIGS. 5-8 show diagrams of a working example of a coupling device for the audio output described in FIGS. 1-4 as base line out 105. To achieve the desired connectivity, additional circuitry to the phone to enable desired impedance matching was used. The circuitry of FIGS. 5-8 illustrate just an example to enable the utilization of an existing phone product to act functionally. The circuit is referred to as the "Coupling Device".

The coupling device allows the speaker driver 193 of the phone to drive the microphone inputs 115 of the computer's sound card. The (35 ohm) speaker of the phone was disconnected to allow easy connection to the coupling device, and a (33 ohm) resistor 510 was added across the differential inputs of the coupling device. This resistor 510 prevents the absence of the speaker from significantly affecting the operation of the speaker driver 193. The coupling device isolates the phone from the sound card 116, attenuates the signal to